

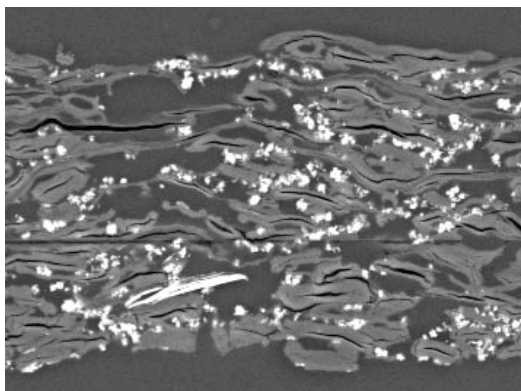
## Paper Characterization Image Analysis Report 356

### Sample Description

A Tiff image showing a cross-section of paper was submitted for analysis along with a grid image for calibration purposes only.

### Purpose of Analysis

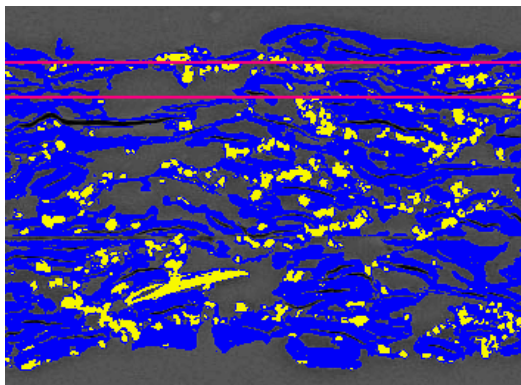
Demonstrate the ability of the Clemex Vision image analyzer to measure the area of fibers and filler. Measurements must be performed on consecutive slices of a specific thickness.



**Figure 1:** Middle portion of the original image (200x-0.48 μm/pixel).

### Procedure

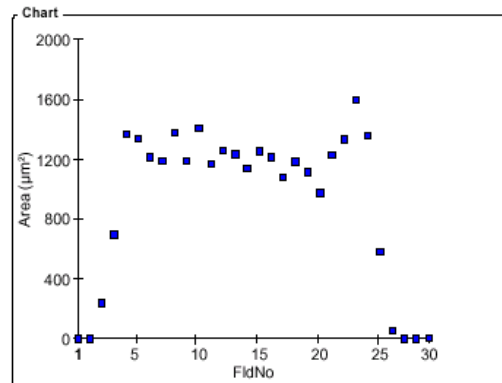
The binarization of the fibers and filler is a straightforward process, which uses Gray Threshold. The first step was to measure the area of both components before any further processing. The next step was to set the thickness and starting position of the region of interest (Process Frame). Using successive vertical increments of the Process Frame, the area of both components was measured slice by slice.



**Figure 2:** Intermediate zone of interest (red) overlaid against the binarized image (yellow: filler, blue: fibers).

### Results Summary

All requested measurements and more are performed on each slice and cumulated for automated statistics and graphics production (Area, Area Percent, Anisotropy). Final results are printed directly from Clemex Vision and data were exported to Excel format.



Statistics	
Minimum:	0 μm <sup>2</sup>
Maximum:	1597.5 μm <sup>2</sup>
Mean:	926.8 μm <sup>2</sup>
Std Dev.:	532.3 μm <sup>2</sup>
Sum:	27803.6 μm <sup>2</sup>
Count:	30
Under:	0
Over:	0
Accepted:	100 %
Field Count:	30
Field Area:	2401.4 μm <sup>2</sup>
Total Area:	72041.2 μm <sup>2</sup>

**Figure 3:** Plot of the fiber area for each slice of 5 microns including cumulative statistics.

No major difficulties were encountered in determining the evolution of both components through the cross-section. The size and the movement of the frame are limited by the calibration factor. Fields with null value can be deleted with a single click. Graphs and statistics are updated automatically.

### Equipment

#### Image Analysis

**System:** Clemex Vision PE  
**Calibration :** 0.48 um / pixel